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STATISTICS COMPILED FROM REPORTS ON CRASHES IN THE U. S.
ARMY AIR SERVICE DURING THE CALENDAR YEARS 1918-1921,
INCLUSIVE, AND RESULTS OF PHYSICAL EXAMINA-
TIONS FOR FLYING DURING THE CALENDAR
YEARS 1920 AND 1921



COMPILED BY THE MEDICAL SECTION
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AIRPLANE CRASHES, 1918 AND 1919, IN THE UNITED STATES ARMY AIR SERVICE.

A BRIEF SUMMARY OF 1,250¹ SPECIAL CRASH REPORTS.

(Prepared in the Office of the Chief Surgeon, Air Service.)

A total of 1,250 reports of crashes were received from the various flying fields, covering a period from the beginning of the war up to January 1, 1920, on special crash report blanks sent out from the Office of the Chief Surgeon, Air Service.

While these crash returns are incomplete, owing to the fact that many fields did not report all of their crashes, it is thought that the 1,250 reports received are representative and will show valuable data bearing on the causes leading up to the crashes, injuries suffered by pilot, extent of damage resulting to airplane, and other information of interest.

Statistics of these crashes have been compiled in considerable detail but only a brief summary will be given here.

Segregating the 1,250 crashes according to the nature of the crash, it will be seen that bad landing was responsible for a little more than 45 per cent of the total accidents reported, lacking but a little of causing four times as many crashes as any other one cause.

A brief summary of all crashes, listed according to the nature of the crash, is given below:

Nature of crash.	Number.	Per cent of total.
Bad landing.....	563	45.04
All spins.....	160	12.80
Collision (other than with ship).....	120	9.60
Stall (engine trouble).....	97	7.76
Side slip.....	64	5.12
Burning of plane.....	58	4.64
Taxing (collision on ground).....	49	3.92
Nose dives.....	46	3.68
Collision (in air with ship).....	45	3.60
Unknown.....	9	.72
Total.....	1,250	100.00

Taking up the extent of injuries to the pilot as a result of crashes, we find that a little more than one crash out of 10 proved fatal. The nature of crash resulting in the highest percentages of fatalities were collision (in air with ship), nose dives, and all spins, with percentages of 46.67, 30.43, and 27.50 of fatalities, respectively. A brief summary is given below:

Extent of injuries.	Number of crashes.	Per cent of total.
Fatal.....	135	10.80
Injured.....	303	24.24
Uninjured.....	807	64.56
Unknown.....	5	.40
Total.....	1,250	100.00

In assigning a cause for the crash, many factors enter into the situation, so that unless a board is convened and forwards a formal report, very much depends upon the viewpoint of the person making out and sending in the special crash report. When no cause for the crash was given, or the cause as shown was obviously wrong, an arbitrary cause was assigned for the crash by this office in working up this data when the information at hand seemed to justify it. A summary of the crashes by cause is shown below:

Cause of crash.	Number of crashes.	Per cent of total.
Bad judgment.....	597	47.52
Engine trouble.....	263	21.04
Unavoidable.....	225	18.00
Inexperience.....	45	3.60
Body of plane.....	37	2.96
Vertigo.....	12	.96
Acute physical impairment.....	10	.80
Chronic physical impairment.....	3	.24
Unknown.....	61	4.88
Total.....	1,250	100.00

Segregating crashes, according to the period of day in which the accident occurred, shows the following:

Period of day.	Number of crashes.	Per cent of total.
From 5 a. m. to 10 a. m.....	313	25.04
From 10 a. m. to 3 p. m.....	552	44.16
From 3 p. m. to 6 p. m.....	255	20.40
From 6 p. m. to 5 a. m.....	112	8.96
Unknown.....	18	1.44
Total.....	1,250	100.00

Segregating the crashes by the age of the fliers, we find that 65 per cent occurred among aviators between 21 and 26 years of age. A summary is given below:

Age of flier.	Number of crashes.	Per cent of total.
18 to 20 years.....	58	4.64
21 to 23 years.....	437	34.96
24 to 26 years.....	376	30.08
27 to 30 years.....	220	17.60
31 to 35 years.....	61	4.88
36 to 40 years.....	12	.96
41 to 45 years.....	5	.40
Unknown.....	81	6.48
Total.....	1,250	100.00

In regard to the number of hours dual instruction received by the flier before the occurrence of the crash, we

¹ Statistics compiled by the Information Division, Office of the Chief of Air Service, show 2,311 airplane crashes in the United States from April 6, 1917, to January 1, 1920. Some of these were not included in this compilation because of their minor character, others because they occurred at points where it was impracticable for a flight surgeon to make an investigation.

find that 71 per cent has received from 5 to 19 hours dual instruction in the piloting of a plane prior to the occurrence of the crash reported. A summary is given below:

Hours dual instruction received.	Number of crashes.	Per cent of total.
Less than one hour's instruction.....	5	0.40
1 to 5 hours' instruction.....	66	5.28
5 to 9 hours' instruction.....	524	41.92
10 to 19 hours' instruction.....	366	29.28
20 to 29 hours' instruction.....	46	3.68
Over 29 hours' instruction.....	30	2.40
Unknown.....	213	17.04
Total.....	1,250	100.00

Experience in solo flying among aviators meeting with crashes varied from a few hours in the case of the cadet to more than a thousand with the experienced bird man. A summary shows the following:

Experience in solo flying.	Number of crashes.	Per cent of total.
Less than 25 hours' solo.....	259	20.72
25 to 50 hours' solo.....	156	12.48
50 to 100 hours' solo.....	202	16.16
100 to 250 hours' solo.....	301	24.08
250 to 500 hours' solo.....	136	10.88
500 to 1,000 hours' solo.....	45	3.60
Over 1,000 hours' solo.....	26	2.08
Unknown.....	125	10.00
Total.....	1,250	100.00

Taking up the question of weather conditions as bearing on the number of crashes, we find that almost 75 per cent occurred during fair weather. Unfortunately, for purposes of correlation, we have no record of the total amount of flying done under the varying weather conditions. The following table gives weather conditions prevailing at the time of occurrence of crashes reported:

Weather conditions.	Number of crashes.	Per cent of total.
Fair.....	920	73.60
Windy (over 15 miles).....	151	12.08
Cloudy.....	75	6.00
Stormy.....	45	3.60
Foggy.....	40	3.20
Dark.....	10	.80
Unknown.....	9	.72
Total.....	1,250	100.00

Segregating the number of crashes according to the type of plane used, we find that a total of 1,092 crashes out of the 1,250 reported, occurred during the use of the Curtiss plane. Unfortunately again, we have no statistics showing comparison between the number of crashes occurring and the total hours flown by pilots using the various types of machines.

A further segregation of crashes by type of plane used, and according to the nature of the crash resulting, reveals the fact that crashes of a like nature occur relatively more frequent in one type of plane than in another. For instance, 61.64 per cent of all crashes occurring in the use of the DeHaviland are attributed to bad landing, while the percentage of crashes due to bad landings by pilots of Curtiss and "Scout" planes were but 43.98 and 31.25 per cent, respectively. In the matter of spins, 25 per cent of all accidents occurring during the use of "Scout" planes are attributed to this cause, as against but 3.49 per cent

for the DeHaviland. In the stalls (engine trouble), the Curtiss plane shows the lowest percentage (7.60 per cent), and "Foreign" planes the highest (11.43 per cent).

A brief summary showing crashes by type of plane used is shown below:

Type of plane.	Number of crashes.	Per cent of total.
Curtiss.....	1,092	87.36
DeHaviland.....	86	6.88
Foreign.....	35	2.80
Scouts.....	16	1.28
All others.....	16	1.28
Unknown.....	5	.40
Total.....	1,250	100.00

Tabulating injuries and fatalities according to type of plane we find the Curtiss plane was used in 87.36 per cent of all crashes reported, but was responsible for only 75.78 of total fatalities. In the matter of injuries, however, it rises slightly above the relative proportion of crashes, being charged with 88.78 per cent of all injuries.

The highest fatality incidence in ratio to the number of crashes occurred in the use of "Scout" (including all scouts except foreign planes) planes, 43.75 per cent of all crashes terminating fatally to the pilot, as against 9.20 per cent for the Curtiss machine.

A brief summary of injuries by type of plane is given herewith:

Type of plane.	Killed.	Injured.	Uninjured.	Unknown.	Total.
Curtiss.....	105	269	669	3	1,092
De Haviland.....	13	19	52	2	96
Scout.....	7	5	4	.....	16
Foreign.....	5	8	22	.....	35
All other.....	5	1	10	.....	16
Unknown.....	.....	1	4	.....	5
Total.....	135	303	807	3	1,250
Percentage.....	10.80	24.24	64.56	0.40	100.00

Taking up the question of age and its possible bearing on the cool judgment and resourcefulness so necessary in the case of a flier, it is interesting to note that the percentage of crashes attributed to bad judgment on the part of the pilot shows a steady decline from the young pilot of 18 or 20 to the more mature judgment of the flier of 30 to 35 years of age. In reverse ratio are the percentage of crashes listed as unavoidable, which show a percentage of only 12.08 of all crashes occurring among pilots from 18 to 20 years of age, and rises to 26.81 per cent of all crashes among pilots from 27 to 30 years of age.

Number of crashes, are percentages of total, in which the cause was shown as bad judgment or unavoidable, are given below:

Age of pilot.	Cause of crash.			
	Bad judgment.		Unavoidable.	
	Number.	Per cent of total. ¹	Number.	Per cent of total. ¹
18 to 20 years.....	34	58.63	7	12.08
21 to 25 years.....	226	51.71	70	16.02
24 to 28 years.....	166	44.12	67	17.91
27 to 30 years.....	91	41.36	59	26.81
31 to 35 years.....	25	40.98	14	22.95
36 to 40 years.....	6	50.00	.....	.....
41 to 45 years.....	3	60.00	1	20.00
Unknown.....	43	53.09	7	8.64
Total.....	594	47.52	225	18.00

¹ Percentage of total crashes chargeable against each age group.

In basing a conclusion in the preceding table that age might have a tendency to promote prudence and carefulness in a pilot, and assuming that the ranking of pilots to a large extent followed their experience and natural ability as fliers, one would expect to find the percentage of crashes due to bad judgment on the part of the pilot steadily decreasing on passing from the lower ranking officers to the higher, and the percentage of unavoidable crashes steadily increasing. How well such a conclusion is borne out is shown by the following table:

Rank of flier.	Cause of crash.			
	Bad judgment.		Unavoidable.	
	Number.	Per cent of total. ¹	Number.	Per cent of total. ¹
Enlisted personnel.....	14	42.43	4	12.12
Cadet.....	213	56.80	43	11.46
Second lieutenant.....	283	44.77	123	21.04
First lieutenant.....	38	38.00	25	25.00
Captain.....	11	39.29	8	28.57
Major.....	2	16.67	5	41.67
Lieutenant colonel.....	3	60.00		
Colonel.....	3	50.00		
Civilian instructor.....	4	50.00		
Unknown.....	23	45.10	7	13.73
Total.....	594	47.52	225	18.00

¹ Per cent of total crashes chargeable against each group according to rank.

Segregating all crashes by rank of fliers, gives the following figures and percentage:

Rank of flier.	Number of crashes.	Per cent of total.
Enlisted.....	33	2.64
Cadet.....	375	30.00
Second lieutenant.....	632	50.56
First lieutenant.....	100	8.00
Captain.....	28	2.24
Major.....	12	.96
Lieutenant colonel.....	5	.40
Colonel.....	6	.48
Civilian instructor.....	8	.64
Unknown.....	51	4.08
Total.....	1,250	100.00

Segregating the crashes according to the resulting damage to the plane, we find that a little over 43 per cent of total crashes reported resulted in a complete wreck of the machine. Spins, collision in air, nose dives, and side slips show the greatest proportion of total wreckage of plane, with the following percentages: 93, 82, 74, and 67 per cent, respectively. Of all crashes attributed to "Bad landing" 23.6 per cent resulted in a complete wreck of the machine.

A short summary of damages to plane resulting from crashes is shown below:

Damage to airplane.	Number of crashes.	Per cent of total.
Complete wreck.....	539	43.12
Undercarriage, propeller and wings.....	160	12.80
Undercarriage and propeller.....	125	10.00
Propeller and wings.....	89	7.12
Undercarriage and wings.....	84	6.72
Propeller.....	84	6.72
Undercarriage.....	63	5.04
Wings.....	57	4.56
Slight.....	17	1.36
Unknown.....	32	2.56
Total.....	1,250	100.00

Taking up the question of fatalities and injuries resulting from crashes it will be seen that they vary proportionately to the severity of damage to plane. In 95.56 per cent of all fatalities occurring, and in 80.86 per cent of all injuries, the plane was completely wrecked. Nearly one out of four of the crashes (23.93 per cent) resulting in a complete wreck of the machine caused a fatality, and 60 per cent of the remaining resulted in more or less serious injuries to the pilot.

A brief summary of crashes by damage to plane and resulting injury to pilot is given below:

Damage to airplane.	Fate of pilot.				
	Killed.	Injured.	Un-injured.	Un-known.	Total.
Complete wreck.....	129	245	163	2	539
Undercarriage, propeller and wings.....		21	139		160
Undercarriage and propeller.....	1	5	118	1	125
Propeller and wings.....		2	85	2	89
Undercarriage and wings.....	1	8	75		84
Propeller.....		3	81		84
Undercarriage.....		4	59		63
Wings.....	1	4	52		57
Slight.....		1	16		17
Unknown.....	3	10	19		32
Total.....	135	303	807	5	1,250
Percentage.....	10.80	24.24	64.56	0.40	100.00

A distribution of fliers by age for the year 1918 shows the following percentages:

Age.	Per cent of total.	Age.	Per cent of total.
19 years.....	0.5	29 years.....	4.5
20 years.....	4.9	30 years.....	3.6
21 years.....	8.9	31 years.....	2.2
22 years.....	12.7	32 years.....	1.2
23 years.....	13.7	33 years.....	.6
24 years.....	12.9	34 years.....	.5
25 years.....	11.8	35 years.....	.2
26 years.....	10.0	36 years.....	.3
27 years.....	6.8		
28 years.....	5.8	Total.....	100.0

A comparison of the ages of fliers as shown on special crash reports received during the years 1918 and 1919 and that of fliers on duty for the year 1918, by age groups, shows the following:

	Per cent of total fliers for year 1918.	Per cent of total special crash reports received.
18 to 20 years.....	5.4	4.64
21 to 23 years.....	34.4	34.96
24 to 26 years.....	34.5	30.08
27 to 30 years.....	20.7	17.60
31 to 35 years.....	4.7	4.86
36 to 40 years.....	.3	.96
41 to 45 years.....		.40
Unknown.....		6.48
Total.....	100.0	100.00

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STATISTICAL REPORT ON AIRPLANE CRASHES IN THE AIR SERVICE DURING 1920.¹

(Prepared in the Office of the Chief Surgeon, Air Service.)

A total of 312 crashes of heavier-than-air craft were reported by flight surgeons at Air Service stations during 1920. Those include all crashes of military airplanes in which damage was done to the airplane and is thought to include practically all crashes during the year, and certainly includes all serious crashes.

TABLE 1.—Crashes by stations.

(The crash is charged to the station at which the pilot was flying.)

Crashes.	Crashes.
Aberdeen..... 4	March..... 14
Bolling..... 15	Marfa..... 7
Camp Biene..... 1	Mather..... 6
Camp Benning..... 2	Middletown..... 2
Carlstrom..... 26	Mitchel..... 36
Chanute..... 1	Montgomery..... 1
Clark..... 9	Park..... 1
Coblentz..... 2	Post..... 14
El Paso..... 9	Rich..... 2
Fairfield..... 2	Rockwell..... 7
France..... 5	Ross..... 1
Kelly..... 39	Sanderson..... 10
Kindley..... 3	Southey..... 3
Langley..... 18	Border Service Activities..... 7
Laredo..... 12	Ream..... 1
Love..... 2	Red Bluff..... 2
Luke..... 9	Fresno..... 5
McAllen..... 17	
McCook..... 17	Total..... 312

TABLE 2.—Number of crashes in each month.

Crashes.	Crashes.
January..... 16	August..... 26
February..... 24	September..... 23
March..... 33	October..... 15
April..... 43	November..... 24
May..... 34	December..... 25
June..... 24	
July..... 25	Total..... 312

TABLE 3.—Crashes according to rank of pilot.

Crashes.	Crashes.
Not given..... 1	Field officer (major and lieutenant colonel)..... 14
Enlisted..... 17	Foreign and naval officers..... 7
Cadet..... 46	
Second lieutenant..... 159	Total..... 312
First lieutenant..... 44	
Captain..... 24	

NOTE.—The number of officers in the Air Service in each grade on June 30 and December 31 were as follows:

June 30.	December 31.
Colonels..... 11	Major generals..... 1
Lieutenant colonels..... 14	Brigadier generals..... 1
Majors..... 31	Colonels..... 1
Captains..... 259	Lieutenant colonels..... 15
First lieutenants..... 249	Majors..... 130
Second lieutenants..... 507	Captains..... 86
	First lieutenants..... 284
	Second lieutenants..... 497
Total..... 1,071	Total..... 1,015

The average number of cadets under training was 220.

¹ A total of 344 airplane crashes were contained in reports received by the Information Division, Office of the Chief of Air Service, during the calendar year 1921. The discrepancy is accounted for by the fact that 14 crashes were not investigated by flight surgeons because of their minor character and of their occurrence at points somewhat inaccessible to a flight surgeon.

TABLE 4.—Crashes according to rating of pilot.

Crashes.	Crashes.
Not given..... 50	R. M. A..... 34
No rating..... 14	M. A..... 4
Airplane pilot and J. M. A..... 207	
Airplane observer..... 1	
Balloon pilot..... 2	Total..... 312

NOTE.—The number of officers in the Air Service with flying ratings during 1920 was as follows:

June 30.	December 31.
Air pilots..... 615	Air pilots..... 575
M. A..... 39	M. A..... 5
J. M. A..... 66	
Total..... 720	Total..... 580

TABLE 5.—Age of pilot.

Crashes.	Crashes.
Not given..... 6	31 to 35..... 52
Under 20..... 6	36 to 40..... 5
21 to 27..... 183	41 to 45..... 4
28 to 30..... 56	Total..... 312

TABLE 6.—Crashes according to class of training which pilot had received.

Crashes.	Crashes.
Not given..... 84	Reconnaissance..... 43
Cadet training..... 9	Bombing..... 43
Pursuit..... 133	Total..... 312

TABLE 7.—Hours dual instruction of pilot prior to crash.

Crashes.	Crashes.
Not given..... 29	26 to 30..... 13
Less than 6..... 54	31 to 35..... 4
6 to 10..... 123	36 to 40..... 5
11 to 15..... 40	41 to 45..... 13
16 to 20..... 26	
21 to 25..... 5	Total..... 312

TABLE 8.—Hours solo flying by pilot prior to crash.

Crashes.	Crashes.
Not given..... 19	51 to 70..... 9
1 to 5..... 4	70 to 100..... 10
6 to 10..... 2	100 to 200..... 36
11 to 20..... 10	Over 200..... 199
21 to 30..... 10	
31 to 50..... 13	Total..... 312

TABLE 9.—Hours flown by pilot during month preceding crash.

Crashes.	Crashes.
Not given..... 39	26 to 30..... 24
5 or less..... 50	31 to 40..... 16
6 to 10..... 63	41 to 50..... 17
11 to 15..... 41	Over 50..... 7
16 to 20..... 37	
21 to 25..... 18	Total..... 312

TABLE 10.—Month in which pilot was last physically examined prior to crash.

Crashes.	Crashes.
Not given or more than 12 months previous..... 59	July..... 73
January..... 86	August..... 14
February..... 23	September..... 12
March..... 13	October..... 1
April..... 3	November..... 1
May..... 6	December..... 1
June..... 20	Total..... 312

TABLE 11.—Number of previous crashes of pilot.

Crashes.	Crashes.
139 pilots..... 0	5 pilots..... 5
77 pilots..... 1	5 pilots..... 6
37 pilots..... 2	2 pilots..... 7
31 pilots..... 3	1 pilot..... 10
15 pilots..... 4	Total..... 312

NOTE.—The number of pilots in the Air Service on June 30, 1920, was 720, and on December 31, 1920, was 580.

TABLE 12.—Physical defects of pilots who crashed as determined by last prior physical examination.

Crashes.	Crashes.
No physical defects..... 284	Ear drum retracted..... 1
One eye 20/20 to 20/30..... 3	Unstable nervous system..... 2
Both eyes 20/20 to 20/30..... 1	Elbow deformity..... 1
One or both eyes less than 20/40..... 1	Color blindness..... 1
Defective depth perception..... 1	Nystagmus..... 1
Esophoria..... 1	Otitis media..... 1
Exophoria..... 1	Nasal obstruction..... 2
Hyperphoria..... 5	Hypertrophied tonsils..... 2
Hyperphoria and esophoria..... 1	Defective teeth..... 1
Low prism divergence with esophoria..... 1	Perforated ear drum..... 1
	Total..... 312

The majority of physical defects noted in this table were not causative factors of the crashes reported.

TABLE 14.—Previous flights made by pilot on date of crash.

Crashes.	Crashes.
None..... 185	Five..... 8
One..... 77	Six..... 2
Two..... 20	Seven..... 1
Three..... 11	Nine..... 2
Four..... 6	Total..... 312

TABLE 15.—Duration of flight before crash.

Crashes.	Crashes.
Not given..... 18	3 to 4 hours..... 6
Less than 15 minutes..... 87	4 to 5 hours..... 3
15 to 30 minutes..... 54	5 to 6 hours..... 1
30 to 60 minutes..... 65	Over 6 hours..... 1
1 to 2 hours..... 58	Total..... 312
1 to 3 hours..... 19	

TABLE 16.—Nature of work being performed at time of crash.

Crashes.	Crashes.
Not given..... 22	Testing..... 23
Instructing..... 8	Border patrol..... 46
Receiving instruction..... 15	Cross country flights..... 104
Practice flight..... 89	Total..... 312
Stunting or acrobatics..... 16	
Ferrying..... 9	

TABLE 17.—Nature of pilot's duties at field.

Crashes.	Crashes.
Not given..... 23	Regular flying duty including officers on border patrol..... 63
Under flying training..... 51	Total..... 312
Flying instructor..... 17	
Administrative (adjutant squadron officer, flight surgeon, engineer, radio, supply, etc.)..... 158	

TABLE 18.—Result of crash for pilot.

Crashes.	Crashes.
Uninjured..... 217	Killed..... 34
Slightly injured..... 48	Total..... 312
Severely injured..... 13	

TABLE 19.—Cockpit of pilot.

Crashes.	Crashes.
Not given..... 23	Single seater..... 27
Front..... 217	Total..... 312
Rear..... 45	

TABLE 20.—Result of crash for passenger.

Crashes.	Crashes.
No passenger..... 84	Severely injured..... 10
Uninjured..... 160	Killed..... 12
Slightly injured..... 46	Total..... 312

TABLE 21.—Type of plane.

Crashes.	Crashes.
Not given..... 3	SE-5A..... 5
JN-4H..... 26	La Pere..... 2
JN-4HG..... 1	Nieuport..... 3
JN-6H..... 26	Sopwith..... 1
JN-6HG1..... 9	Fokker..... 4
JN-6H0..... 1	Vought..... 2
Curtiss unclassified..... 16	Thomas Morse..... 2
DH-4..... 68	Avro..... 1
DH-4B..... 124	All others..... 4
De Havilland unclassified..... 1	Total..... 312
SE-5..... 13	

TABLE 23.—Damage to plane.

Crashes.	Crashes.
Not given or not known..... 6	Propeller and wings broken..... 26
Undercarriage broken..... 16	Fuselage broken..... 26
Propeller broken..... 10	Complete wreck or washout..... 134
Wings broken..... 15	Plane burned..... 16
Undercarriage and propeller broken..... 37	Total..... 312
Undercarriage and wings broken..... 26	

TABLE 24.—Day of week.

Crashes.	Crashes.
Monday..... 51	Saturday..... 40
Tuesday..... 50	Sunday..... 23
Wednesday..... 54	Total..... 312
Thursday..... 47	
Friday..... 47	

TABLE 25.—Time of day.

Crashes.	Crashes.
Not given..... 1	2 to 4 p. m..... 65
1 to 6 a. m..... 6	4 to 6 p. m..... 43
6 to 8 a. m..... 7	6 to 8 p. m..... 8
8 to 10 a. m..... 49	Total..... 312
10 to 12 m..... 100	
12 to 2 p. m..... 33	

TABLE 26.—Weather.

Crashes.	Crashes.
Clear..... 238	Stormy..... 7
Hazy..... 11	Rain or snow..... 5
Windy..... 21	Foggy..... 9
Gusty..... 4	Total..... 312
Cloudy..... 17	

TABLE 27.—Terrain.

Crashes.	Crashes.
Not given..... 29	Soft (ploughed or muddy)..... 48
Level..... 138	Rough..... 2
Woody..... 15	Water..... 10
Hilly..... 23	Total..... 312
Rolling..... 38	
Marshy..... 9	

TABLE 28.—Stage of flight at which accident occurred.

Crashes.	Crashes.
Not given.....	5
Getting off.....	43
In air.....	81
Landing.....	183
Total.....	312

TABLE 29.—Altitude at which trouble began.

Crashes.	Crashes.
On ground.....	100
Less than 100 feet.....	69
100 to 300 feet.....	39
300 to 600 feet.....	21
600 to 1,000 feet.....	12
1,000 to 3,000 feet.....	43
3,000 to 6,000 feet.....	14
6,000 to 10,000 feet.....	1
10,000 to 15,000 feet.....	2
Over 15,000 feet.....	1
Total.....	312

TABLE 30.—Distance of site of crash from field.

Crashes.	Crashes.
On home field.....	106
One-half mile or less.....	23
One-half to 1 mile.....	5
1 to 2 miles.....	15
2 to 4 miles.....	9
4 to 6 miles.....	4
6 to 8 miles.....	4
8 to 10 miles.....	5
10 to 15 miles.....	20
Over 15 miles.....	121
Total.....	312

TABLE 31.—Cause of crash as reported by flight surgeon.

Crashes.	Crashes.
Not known.....	5
Failure of engine.....	94
Defect of plane.....	26
Fire.....	4
Flat turn.....	5
Collision.....	20
Nose dive.....	1
Side slipping.....	3
Stall.....	16
Misjudged landing.....	19
Pancaking.....	9
Terrain conditions.....	45
Weather conditions.....	27
Unavoidable.....	6
Controls refusing to work.....	3
Inexperience.....	7
Air pocket.....	1
Gasoline exhausted.....	8
Spin.....	6
Poor pilotage.....	7
Total.....	312

TABLE 32.—Cause of crash as determined by crash board.

Crashes.	Crashes.
Not known.....	70
Failure of engine.....	45
Defect in plane.....	11
Fire.....	3
Flat turn.....	4
Collision.....	10
Nose dive.....	1
Side slipping.....	3
Stall.....	8
Misjudged landing.....	3
Pancaking.....	2
Terrain conditions.....	17
Weather conditions.....	6
Unavoidable.....	4
Inexperience.....	6
Air pocket.....	1
Gasoline exhausted.....	5
Spin.....	3
Poor pilotage.....	6
No crash board.....	104
Total.....	312

TABLE 33.—Arrival of first aid.

Crashes.	Crashes.
Not given or not needed.....	98
Immediately.....	70
5 minutes.....	98
10 minutes.....	19
20 minutes.....	7
30 minutes.....	6
1 hour.....	8
2 hours.....	4
3 hours.....	1
4 hours or over.....	1
Total.....	312

TABLE 34.—Ambulance.

Crashes.	Crashes.
None.....	193
Horse drawn.....	3
Motor.....	106
Airplane ambulance.....	10
Total.....	312

Number of flying hours from January 1, 1920, to December 31, 1920: 74,105.

NOTE.—As an example of the information which can be secured, the following correlated data on crashes and injuries in crashes of DH-4's and DH-4B's is given.

Comparison of results between crashes of DH-4 and DH-4B airplanes.

TOTAL NUMBER OF DH-4 CRASHES, 68.

	Total.	No passenger or not given.	Uninjured	
			Number.	Rate.
Result to pilot.....	68		55	80.88
Result to passenger.....	68	9	41	60.48

	Slightly injured.		Severely injured.		Killed.	
	Num-ber.	Rate.	Num-ber.	Rate.	Num-ber.	Rate.
Result to pilot.....	4	5.88	3	4.42	6	8.84
Result to passenger.....	13	22.03	2	3.38	3	5.08

TOTAL NUMBER OF DH-4B CRASHES, 124.

	Total.	No passenger or not given.	Uninjured	
			Number.	Rate.
Result to pilot.....	124		104	83.87
Result to passenger.....	124	11	90	79.64

	Slightly injured.		Severely injured.		Killed.	
	Num-ber.	Rate.	Num-ber.	Rate.	Num-ber.	Rate.
Result to pilot.....	10	8.05	3	2.41	7	5.64
Result to passenger.....	18	15.92			5	4.42

Of the above airplanes which crashed, 1 DH-4 and 8 DH-4B's were burned.

According to information obtained from the supply group, the total number of flights made by the DH-4 plane was 6,713, total flying time 11,162.21 hours. The total number of flights made by the DH-4B plane being 12,322 and total flying time 24,404.90 hours.

From the above comparison it appears that the DH-4B is much safer for the pilot than the DH-4. The degree of safety as shown by the percentages of killed and seriously injured being as 8.05 in the DH-4B's to 13.26 in the DH-4's. The danger to the passenger is also less in crashes of the DH-4B than in crashes of DH-4, the ratio being as 5.08 in the crashes of DH-4B's to 8.64 in crashes of DH-4's.

In crashes of DH-4's in which pilots were injured or killed, 12 out of 13 pilots were piloting from the front cockpit. In the crashes of the DH-4B's in which the pilots were injured, or killed all were piloting from the front cockpit.

The danger of fire in the DH-4B, however, appears to be much greater than in the DH-4.

STATISTICAL REPORT ON AIRPLANE CRASHES IN THE AIR SERVICE DURING THE PERIOD JANUARY 1, 1921, TO DECEMBER 31, 1921.

(Prepared in the Office of the Chief, Medical Section.)

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A total of 328¹ crashes of heavier-than-air craft were reported by flight surgeons at Air Service stations of the Regular Army during the period covered by this report. These are all of the crashes occurring at stations where there was a flight surgeon. In addition, reports of two crashes, occurring at stations where there were no flight surgeons, and in which there were fatalities, were obtained from the training and operations group. The two fatalities caused by a bomb explosion at Aberdeen are not included in these statistics, as this was not considered an airplane crash. The crashes reported include all accidents in which there was any material damage to the airplane as the result of a crash. There was but one crash by a lighter-than-air craft during the year with no deaths resulting.

¹ A total of 344 airplane crashes were contained in reports received by the Information Division, Office of the Chief of Air Service during the calendar year 1921. The discrepancy is accounted for by the fact that 14 crashes were not investigated by flight surgeons because of their minor character and of their occurrence at points somewhat inaccessible to a flight surgeon.

TABLE 1.—Crashes by stations.

(The crash is charged to the station at which the pilot was flying.)

Aberdeen, Md.	1	Fort Sheridan.	1
Bolling Field.	15	Godman Field.	1
Border service activities.	16	Kelly Field.	39
Camp Holabird.	1	Kindley Field.	2
Camp Lewis.	2	Langley Field.	65
Carlstrom Field.	33	Luke Field.	4
Chanute Field.	5	McCook Field.	11
Clark Field.	4	March Field.	9
Coblenz, Germany.	3	Mather Field.	26
Crissy Field.	1	Mitchel Field.	10
Dorr Field.	1	Montgomery, Ala.	2
Ellington Field.	12	Pope Field.	1
Eugene, Oreg.	4	Post Field.	57
Fort Howard.	1	Scott Field.	1
Fort McPherson.	1		
Fort Omaha.	1	Total.	330

TABLE 2.—Number of crashes in each month.

Crashes.		Crashes.	
January.....	23	August.....	44
February.....	20	September.....	43
March.....	25	October.....	19
April.....	22	November.....	15
May.....	27	December.....	18
June.....	33		
July.....	41	Total.....	330

TABLE 3.—Crashes according to rank of pilot.

	Crashes.		Crashes.
Not given.....	1	Lieutenant colonel.....	4
Enlisted.....	13	Foreign officer.....	5
Cadet.....	62	Marine Corps officer.....	2
Second lieutenant.....	31	Naval officer.....	1
First lieutenant.....	147	Total.....	330
Captain.....	43		
Major.....	21		

The average number of cadets in training during the period covered by this report was 180.

TABLE 4.—Crashes according to rating of pilot.

	Crashes.		Crashes.
Not given.....	35	Airplane pilot and J. M. A....	198
No rating.....	89	R. M. A.....	8
		Total.....	330

On December 31, 1921, there were 861 Air Service officers of the Regular Army with flying ratings. The number of Reserve officers with flying ratings on December 31 was approximately 5,000.

TABLE 5.—Age of pilot.

Crashes.		Crashes.	
Not given.....	7	41 to 45.....	5
21 to 27.....	185	46 to 50.....	1
28 to 30.....	74	Total.....	330
31 to 35.....	48		
36 to 40.....	10		

TABLE 6.—Crashes according to class of training which pilot had received.

Crashes.	Crashes.
Not given..... 26	Bombing..... 69
Cadet training..... 18	Two or more of above..... 20
Pursuit..... 101	Total..... 330
Reconnaissance..... 96	

TABLE 7.—Hours dual instruction of pilot prior to crash.

Crashes.	Crashes.
Not given..... 22	26 to 30..... 12
Less than 6..... 41	31 to 35..... 6
6 to 10..... 119	36 to 40..... 2
11 to 15..... 51	41 to 45 or above..... 25
16 to 20..... 30	Total..... 330
21 to 25..... 22	

TABLE 8.—Hours solo flying by pilot prior to crash.

Crashes.	Crashes.
Not given..... 14	51 to 70..... 10
1 to 5..... 5	71 to 100..... 21
6 to 10..... 5	100 to 200..... 73
11 to 20..... 7	Over 200..... 161
21 to 30..... 12	Total..... 330
31 to 50..... 22	

TABLE 9.—Hours flown by pilot during month preceding crash.

Crashes.	Crashes.
Not given..... 14	26 to 30..... 5
5 or less..... 63	31 to 40..... 27
6 to 10..... 51	41 to 50..... 6
11 to 15..... 57	Over 50..... 10
16 to 20..... 44	Total..... 330
21 to 25..... 33	

TABLE 10.—Month in which pilot was last physically examined prior to crash.

Crashes.	Crashes.
Not given, or more than 12 months previous..... 17	1921:
1920:	January..... 10
January..... 1	February..... 6
May..... 1	March..... 8
June..... 8	April..... 3
July..... 69	May..... 2
August..... 5	June..... 4
September..... 13	July..... 154
October..... 10	August..... 7
November..... 4	September..... 3
December..... 5	Total..... 330

TABLE 11.—Number of previous crashes by pilots.

Previous crashes.	Previous crashes.
154 pilots..... 0	4 pilots..... 5
87 pilots..... 1	1 pilot..... 6
49 pilots..... 2	2 pilots..... 7
23 pilots..... 3	2 pilots..... 9
8 pilots..... 4	Total..... 330

TABLE 12.—Physical defects of pilots who crashed as determined by last prior physical examination.

Pilots.	Pilots.
No physical defects..... 306	Flat foot..... 1
One eye between 20/20 and 20/30..... 1	Varicocele..... 1
Both eyes 20/20 to 20/30..... 2	Overweight..... 1
Hyperphoria..... 4	Cardiac murmurs..... 1
Exophoria..... 1	Cardiac arrhythmia..... 1
Angle of convergence..... 1	Hypertrophied tonsils..... 1
Hearing—one ear defective..... 6	Hypertrophied turbinate..... 1
Hearing—both ears defective..... 1	Total..... 330
Unstable nervous system..... 1	

The majority of physical defects noted in this table were not causative factors of the crashes reported.

TABLE 14.—Previous flights made by pilot on date of crash.

Flights.	Flights.
215 pilots..... 0	2 pilots..... 6
57 pilots..... 1	2 pilots..... 7
25 pilots..... 2	2 pilots..... 8
14 pilots..... 3	5 pilots..... 9
5 pilots..... 4	330
3 pilots..... 5	

TABLE 15.—Duration of flight before crash.

Crashes.	Crashes.
Not given..... 20	3 to 4 hours..... 14
Less than 15 minutes..... 94	4 to 4 hours..... 2
15 to 30 minutes..... 67	5 to 6 hours..... 2
31 to 60 minutes..... 54	Over 6 hours..... 2
1 to 2 hours..... 58	Total..... 330
2 to 3 hours..... 17	

TABLE 16.—Nature of work being performed at time of crash.

Crashes.	Crashes.
Not given..... 1	Border or forest patrol..... 18
Instructing..... 10	Cross country flight..... 129
Receiving instruction..... 13	Bombing or bombing practice..... 11
Practice flight..... 103	Total..... 330
Stunting or acrobatics..... 7	
Ferrying..... 17	
Testing..... 21	

TABLE 17.—Nature of pilot's duties at field.

Crashes.	Crashes.
Not given..... 11	Administrative (adjutant, squadron officer, flight surgeon, engineer, radio, supply, etc.)..... 137
Under flying training..... 122	Total..... 330
Flying instructor..... 8	
Regular flying duty, including border and forest patrol..... 52	

TABLE 18.—Result of crash for pilot.

Crashes.	Crashes.
Uninjured..... 238	Killed..... 38
Slightly injured..... 40	Total..... 330
Severely injured..... 14	

Rank of pilots killed.

Crashes.	Crashes.
Enlisted..... 4	Captain..... 5
Cadet..... 6	Major..... 1
Second lieutenant..... 6	Total..... 38
First lieutenant..... 16	

TABLE 19.—Cockpit of pilot.

Crashes.	Crashes.
Not given..... 11	Single seater..... 44
Front..... 243	Total..... 330
Rear..... 32	

TABLE 20.—Result of crash for passengers.

Passengers.	Passengers.
No passenger..... 100	Severely injured..... 13
Uninjured..... 185	Killed..... 31
Slightly injured..... 26	Total..... 355

There were 6 passengers, including 2 civilians, killed in one crash, and also 1 passenger severely injured and 1 (civilian) killed in one crash. One other civilian passenger was killed, making a total of 4 civilians killed who were flying as passengers in Army aeroplanes. Three passengers were killed and 1 severely injured in a single crash, and in another crash 2 passengers were killed.

¹ Statistics of the Information Division, Office of the Chief of Air Service give the number of pilots killed as 39, number of passengers, 32; total, 71. The discrepancy is occasioned by the inclusion by the Information Division of 2 fatalities (one pilot and one passenger) which occurred at Aberdeen when the tail skid of an airplane struck and exploded a bomb.

Rank of passengers killed.

Civilian.....	4	Lieutenant colonel.....	1
Enlisted.....	14	Total.....	31
Cadet.....	5		
First lieutenant.....	7		

TABLE 21.—Type of plane.

Crashes.		Crashes.	
JN-4H.....	6	Fokker.....	1
JN-4HG.....	1	SE-5.....	28
JN-6H.....	33	SE-5A.....	9
JN-6HG1.....	1	Nieuport.....	1
Curtiss unclassified.....	14	Martin bomber.....	10
Caproni.....	1	Thomas Morse.....	5
DH-4.....	6	All other.....	12
DH-4B.....	195	Total.....	330
De Haviland unclassified.....	6		
Handley-Page.....	1		

TABLE 23.—Damage to plane.

Crashes.		Crashes.	
Not given or not known.....	4	Propeller and wings broken.....	10
Undercarriage broken.....	13	Fuselage broken.....	42
Propeller broken.....	11	Complete wreck or washout.....	154
Wings broken.....	6	Burned.....	26
Undercarriage and propeller broken.....	39	Total.....	330
Undercarriage and wings broken.....	25		

TABLE 24.—Day of week.

Crashes.		Crashes.	
Monday.....	60	Saturday.....	36
Tuesday.....	40	Sunday.....	25
Wednesday.....	62	Total.....	330
Thursday.....	55		
Friday.....	52		

TABLE 25.—Time of day.

Crashes.		Crashes.	
Not given.....	3	2 to 4 p. m.....	66
1 to 6 a. m.....	1	4 to 6 p. m.....	38
6 to 8 a. m.....	8	6 to 8 p. m.....	19
8 to 10 a. m.....	58	8 to 12 p. m.....	9
10 to 12 m.....	87	Total.....	330
12 to 2 p. m.....	41		

TABLE 26.—Weather.

Crashes.		Crashes.	
Not given.....	2	Rain or snow.....	7
Clear.....	221	Foggy.....	11
Hazy.....	6	Dark or at night.....	4
Windy.....	35	Total.....	330
Cloudy.....	22		
Stormy.....	22		

TABLE 27.—Terrain.

Crashes.		Crashes.	
Not given.....	11	Soft (ploughed or muddy land).....	31
Level.....	151	Thickly settled or small.....	9
Woody.....	12	Rough.....	49
Hilly.....	20	Water.....	22
Rolling.....	20	Total.....	330
Marshy.....	5		

TABLE 28.—Stage of flight at which accident occurred.

Crashes.		Crashes.	
Not given.....	2	On ground.....	1
Getting off.....	63	Total.....	330
In air.....	89		
Landing.....	175		

TABLE 29.—Altitude at which trouble began.

Crashes.		Crashes.	
On ground.....	130	3,000 to 6,000 feet.....	16
Less than 100 feet.....	60	6,000 to 10,000 feet.....	6
100 to 300 feet.....	44	10,000 to 15,000 feet.....	1
300 to 600 feet.....	18	Total.....	330
600 to 1,000 feet.....	11		
1,000 to 3,000 feet.....	41		

TABLE 30.—Distance of site of crash from field.

Crashes.		Crashes.	
On home field.....	102	6 to 8 miles.....	8
One-half mile or less.....	18	8 to 10 miles.....	4
One-half to 1 mile.....	9	10 to 15 miles.....	13
1 to 2 miles.....	14	Over 15 miles.....	143
2 to 4 miles.....	8	Total.....	330
4 to 6 miles.....	11		

TABLE 31.—Cause of crash as reported by flight surgeon.

Crashes.		Crashes.	
Not known.....	8	Spin.....	6
Acute physical impairment.....	1	Poor pilotage.....	19
Failure of engine.....	84	At night.....	6
Defect in plane.....	31	Out of oil.....	2
Flat turn.....	1	Tire trouble.....	5
Collision.....	17	Stoppage in gas feed.....	8
Side slipping.....	5	Burst oil lead.....	1
Skidding.....	2	Fatigue of pilot.....	1
Stall.....	9	Unavoidable.....	7
Misjudged landing.....	31	Controls jammed.....	4
Pancaking.....	10	Air pocket.....	1
Terrain conditions.....	32	Commercial gasoline.....	1
Weather conditions.....	24	Total.....	330
Inexperience.....	4		
Gasoline exhausted.....	10		

TABLE 32.—Cause of crash as determined by crash board.

Crashes.		Crashes.	
Not known.....	27	Inexperience.....	1
Failure of engine.....	27	Gasoline exhausted.....	3
Defect in plane.....	9	Spin.....	4
Collision.....	12	Poor pilotage.....	6
Side slipping.....	3	At night.....	5
Skidding.....	2	Out of oil.....	1
Controls jammed.....	2	Tire trouble.....	3
Air pocket.....	1	Stoppage in gas feed.....	3
Stall.....	7	Unavoidable.....	7
Misjudged landing.....	10	No crash board.....	161
Pancaking.....	7	Total.....	330
Terrain conditions.....	17		
Weather conditions.....	12		

TABLE 33.—Arrival of first aid.

Crashes.		Crashes.	
Not given or not needed.....	97	31 minutes to 1 hour.....	5
Immediately.....	121	1 to 2 hours.....	5
3 to 5 minutes.....	57	2 to 3 hours.....	1
6 to 10 minutes.....	14	3 to 4 hours or over.....	9
11 to 20 minutes.....	11	Total.....	330
21 to 30 minutes.....	10		

TABLE 34.—Type of ambulance used.

Crashes.		Crashes.	
None.....	190	All others.....	14
Motor ambulance.....	109	Total.....	330
Airplane ambulance.....	17		

Number of flying hours from January 1, 1921, to November 30, 1921: 65,882.53. The number of flying hours for December, 1921, is not at present available.

NOTE.—The above statistics have not been analyzed or correlated, but all crash reports have been coded and code cards prepared and punched, so that analysis and correlation of any of the statistics given above can be made at any time and in a few minutes.

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Chief of Medical Section.

STATISTICS SHOWING RESULTS OF PHYSICAL EXAMINATIONS FOR FLYING, 1920.

Number of examinations arranged according to the purpose for which the examination was given.

Civilian applicants for appointment as cadets, Air Service.....	232
Enlisted applicants for appointment as cadets, Air Service.....	640
Officers for commission in the Air Service, Regular Army.....	1,138
Semiannual examinations (given in January and July of each year).....	1,237
Special examinations (given when ordered by the commanding officer or thought advisable by the flight surgeon)	17
For transfer to the Air Service from other branches of the Army.....	44
For training of nonflying officers detailed with the Air Service and nonflying Air Service Officers, including Medical, Naval, and Foreign Officers.....	192
Total physical examinations for flying during 1920.....	3,500

(a) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS OF CIVILIAN APPLICANTS FOR APPOINTMENT AS CADETS AIR SERVICE.

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Not given.....	9	5	55.55	4	44.45						
Under 21 years.....	53	25	47.17	28	52.83						
21-27 years.....	163	105	64.41	58	35.59						
28-30 years.....	5	1	20.00	3	60.00	1	20.00				
31-35 years.....	2	1	50.00	1	50.00						
36-40 years.....											
41-45 years.....											
46-50 years.....											
Total.....	232	137	59.05	94	40.52	1	.43				

(b) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS OF ENLISTED APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

Not given.....	22	14	63.64	8	36.36						
Under 21 years.....	205	146	71.22	57	27.80	2	0.98				
21-27 years.....	339	249	73.45	85	25.07	4	1.18	1	0.30		
28-30 years.....	34	17	50.00	15	44.11	2	5.89				
31-35 years.....	25	10	40.00	15	60.00						
36-40 years.....	12	2	16.66	10	83.34						
41-45 years.....	3			3	100.00						
46-50 years.....											
Total.....	640	438	68.43	193	30.15	8	1.26	1	.16		

(c) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS FOR FLYING OF FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

Not given.....	5	2	40.00	1	20.00	2	40.00				
Under 21 years.....											
21-27 years.....	648	556	85.80	56	8.62	34	5.27	2	0.31		
28-30 years.....	226	181	80.08	31	13.73						
31-35 years.....	168	146	86.87	14	8.37	8	4.76				
36-40 years.....	58	44	75.86	14	24.14						
41-45 years.....	22	17	77.27	2	9.09	1	4.55	1	4.55	1	4.54
46-50 years.....	11	5	45.45	5	45.45			1	9.10		
Total.....	1,138	951	83.57	123	10.81	59	5.18	4	.35	1	.09

(d) RESULTS, BY AGES, OF SEMIANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

(A physical examination for flying is required twice a year of all pilots. Some of those disqualified in this table were for temporary disabilities. As soon as such disabilities have been corrected by proper treatment a reexamination is given, and the pilot is again authorized to fly. See next table.)

Not given.....	38	30	78.95	6	15.79	2	5.26				
Under 21 years.....	74	66	89.19	5	6.76	3	4.05				
21-27 years.....	611	536	87.56	38	6.22	38	6.22				
28-30 years.....	204	178	87.26	12	5.88	14	6.86				
31-35 years.....	198	158	79.79	22	11.12	17	8.59			1	0.58
36-40 years.....	77	61	79.22	7	9.09	6	7.79	2	2.60	1	1.30
41-45 years.....	22	12	54.55	3	13.63	4	18.18	2	9.09	1	4.55
46-50 years.....	12	4	33.33	5	41.67	3	25.00				
Total.....	1,237	1,045	84.47	98	7.93	87	7.04	4	.32	3	.24

(e) RESULTS, BY AGES, OF SPECIAL PHYSICAL EXAMINATIONS OF FLIERS.

(Upon advice of flight surgeons.)

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Not given.....	1	1	100.00								
Under 21 years.....	12	7	58.34	4	33.33	1	8.33				
21-27 years.....	2	1	50.00			1	50.00				
28-30 years.....	1	1	100.00								
31-35 years.....											
36-40 years.....											
41-45 years.....											
46-50 years.....	1	1	100.00								
Total.....	17	11	64.71	4	23.53	2	11.76				

(f) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS OF APPLICANTS (OFFICERS) FOR TRANSFER TO THE AIR SERVICE FROM OTHER BRANCHES OF THE SERVICE.

Not given.....	2			2	100.00						
Under 21 years.....	18	8	44.44	10	55.56						
21-27 years.....	10	7	70.00	3	30.00						
28-30 years.....	6	4	66.67	2	33.33						
31-35 years.....	4	2	50.00	2	50.00						
36-40 years.....	3	1	33.33	1	33.33			1	33.33		
41-45 years.....	1			1	100.00						
46-50 years.....											
Total.....	44	22	50.00	21	47.73			1	2.27		

(g) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS FOR FLYING TRAINING OF NONFLYING OFFICERS DETAILED WITH THE AIR SERVICE AND NONFLYING AIR SERVICE OFFICERS (INCLUDING MEDICAL, NAVAL, AND FOREIGN OFFICERS).

(The percentage of officers who were qualified as shown by this table is large owing to the fact that many nonflying officers of the Air Service, and those of other branches attached thereto, had previously been disqualified for flying, or knew that they had physical defects, and therefore did not take the examination.)

Not given.....	8	8	100.00								
Under 21 years.....	93	88	94.63	5	5.37						
21-27 years.....	37	35	94.58	1	2.71	1	2.71				
28-30 years.....	34	32	94.12	2	5.88						
31-35 years.....	10	8	80.00	1	10.00	1	10.00				
36-40 years.....	9	7	77.78	2	22.22						
41-45 years.....	1	1	100.00								
46-50 years.....											
Total.....	192	179	93.23	11	5.73	2	1.04				

SUMMARY.

Results of physical examinations irrespective of classes.

Qualified for flying or flying training.....	2,783
Disqualified for flying or flying training.....	544
Waived for both heavier and lighter than air.....	159
Waived for lighter than air only.....	10
Waived for observer only.....	4

Total physical examinations for flying during 1920..... 3,500

Results, by ages, of physical examinations—Summary of Tables (a), (b), (c), (d), (e), (f), and (g) above.

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Not given.....	84	59	70.24	21	25.00	4	4.76				
Under 21 years.....	333	238	71.47	90	27.03	5	1.50				
21-27 years.....	1,885	1,549	82.17	256	13.59	77	4.09	3	0.15		
28-30 years.....	518	420	81.09	65	12.54	33	6.37				
31-35 years.....	434	352	81.11	56	12.88	25	5.77			1	0.24
36-40 years.....	161	117	72.67	34	21.12	7	4.34	2	1.25	1	0.62
41-45 years.....	59	37	62.71	11	18.64	5	8.48	4	6.78	2	3.39
46-50 years.....	26	11	42.31	11	42.31	3	11.54	1	3.84		
Total.....	3,500	2,783	79.51	544	15.56	159	4.54	10	.28	4	.11

Causes of disqualification for which no waivers were granted.

(All disqualifying defects found are given, in some cases there being several defects found in the same man, so that the total number of defects found does not correspond with the number disqualified.)

1. CIVILIAN APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....	1	1	1		2																5
Under 21 years.....	8	4	3		1	1					2			1			4	1		21	46
21 to 27 years.....	18	3	10	5	2	4	3	2			3	1	1		2					35	93
28 to 30 years.....	2					4	3													4	6
31 to 35 years.....																				1	1
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....	29	4	15	8	4	5	4	2			5	1	1	1	2		8	1		61	151

2. ENLISTED APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....	2		4					1												4	12
Under 21 years.....	16	2	8	3	1	3	2	3	1								1	3		39	81
21 to 27 years.....	24	5	16	7	3	8	1	1	1		1				1		4			43	115
28 to 30 years.....	3	1	1	1	2															8	16
31 to 35 years.....	2		3	1													1			12	19
36 to 40 years.....	1			1	1	1	1													10	15
41 to 45 years.....	1																			2	3
Total.....	49	8	32	13	7	12	4	5	2		1				1		9			118	261

3. FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....			1																		1
Under 21 years.....																					
21 to 27 years.....	12	2	8	4		4	2		1		2				1	1	3	1		32	75
28 to 30 years.....	8	2	5	4		1					1	1	1		1	1	1	1		18	45
31 to 35 years.....	4	1	4	1		3			1		2				2	1	1			8	26
36 to 40 years.....	4		6	2	1						1				1			1		8	25
41 to 45 years.....																				2	2
46 to 50 years.....	2			1																2	5
Total.....	30	5	24	12	1	8	2		2		5	1	3	1	4	2	5	3	1	70	179

4. SEMI-ANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....	3	1	1			1														3	9
Under 21 years.....	1	1	1	1		1		1												3	9
21 to 27 years.....	8	4	13		1	4					1				1		2			23	58
28 to 30 years.....	3		1	2							2						2	1		8	19
31 to 35 years.....	5		2	2	1	6		1									1			16	34
36 to 40 years.....	4		2			1												1		3	15
41 to 45 years.....	1										1									3	5
46 to 50 years.....	1		1			1														5	8
Total.....	26	6	21	5	2	14		2			4				1		4	2	2	68	157

5. SPECIAL PHYSICAL EXAMINATIONS OF FLIERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....			1																	5	6
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....			1																	5	6

6. APPLICANTS FOR TRANSFER TO THE AIR SERVICE FROM OTHER BRANCHES OF THE ARMY.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....	1	1																			2
Under 21 years.....	3				1		1	2					1		1					6	15
21 to 27 years.....	2	1			1		1													1	6
28 to 30 years.....							2														2
31 to 35 years.....																					2
36 to 40 years.....																					1
41 to 45 years.....			1																	1	2
46 to 50 years.....	1																				
Total.....	7	2	1		2	5	1	2					1		1					8	30

Causes of disqualification for which no waivers were granted—Continued.

7. PHYSICAL EXAMINATIONS FOR FLYING TRAINING OF NONFLYING OFFICERS DETAILED WITH THE AIR SERVICE AND NONFLYING AIR SERVICE OFFICERS, ETC.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....	4	2	1	1	1															1	10
28 to 30 years.....	1				1																2
31 to 35 years.....																				2	2
36 to 40 years.....								1													1
41 to 45 years.....	2			1	1																4
46 to 50 years.....																					
Total.....	7	2	1	2	3			1												3	19

SUMMARY OF TABLES 1 TO 7 ABOVE SHOWING NO WAIVERS.

Civilian applicants.....	29	4	15	8	4	5	4	2			5	1	1	1	2		8	1		61	151
Enlisted applicants.....	49	8	32	13	7	12	4	5	2		1				1		9			118	261
For commission.....	30	5	24	12	1	8	2		2		5	1	3	1	4	2	5	3	1	70	179
Semiannual examination.....	26	6	21	5	2	14		2			4				1		4	2	2	68	157
Special examinations.....			1																	5	6
For transfer.....	7	2	1		2	5	1	2					1		1					8	30
For detail.....	7	2	1	2	3			1												3	19
Total.....	148	27	95	40	19	44	11	12	4		15	2	5	2	9	2	26	6	3	333	803

Causes of disqualification waived for both heavier and lighter than air.

(No serious defects were waived.)

1. CIVILIAN APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....																					
28 to 30 years.....																				1	1
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....																				1	1

2. ENLISTED APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

Under 21 years.....	2																				2
21 to 27 years.....	1		2			1														2	4
28 to 30 years.....																				2	2
Total.....	3		2			1														2	8

3. FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

Age not given.....	1					1														1	3
Under 21 years.....																					
21 to 27 years.....	9	3	6	2		8					5								2	5	40
28 to 30 years.....	4	1	5	2		3					2					1				1	19
31 to 35 years.....	3		1	1		5															10
36 to 40 years.....																					
41 to 45 years.....				1																	1
46 to 50 years.....																					
Total.....	17	4	12	6		17					7					1			2	7	73

Causes of disqualification waived for both heavier and lighter than air—Continued.

4. SEMIANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....	2																				2
Under 21 years.....			2			1															3
21 to 27 years.....	7	1	18	3	1	8														9	47
28 to 30 years.....	2		6	3		3														4	18
31 to 35 years.....	5		5	2		6														3	20
36 to 40 years.....						2														2	8
41 to 45 years.....	3					3															6
46 to 50 years.....						3															3
Total.....	19	1	35	8	1	26														17	107

5. SPECIAL PHYSICAL EXAMINATIONS OF FLIERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....				1																	1
21 to 27 years.....																					1
28 to 30 years.....			1																		
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....			1	1																	2

7. OFFICERS DETAILED WITH THE AIR SERVICE AND NONFLYING AIR SERVICE OFFICERS, ETC.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
28 to 30 years.....	1					1														1	3
36 to 40 years.....	1					1														1	3
Total.....	2					2														2	6

Causes of disqualification waived for lighter than air only.

2. ENLISTED APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....	1																				1
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....	1																				1

3. FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
21 to 27 years.....	1	1					1														3
41 to 45 years.....	1																				1
46 to 50 years.....	1	1	1																		3
Total.....	3	2	1				1														7

4. SEMIANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....																					
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....	2																				2
41 to 45 years.....	2				1																3
46 to 50 years.....																					
Total.....	4				1																5

Causes of disqualification waived for lighter than air only—Continued.

6. APPLICANTS FOR TRANSFER TO THE AIR SERVICE FROM OTHER BRANCHES OF THE ARMY.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
41 to 45 years.....			1	1																	2
Total.....			1	1																	2

Causes of disqualification waived for observer only.

3. FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....																					
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....						1															1
46 to 50 years.....																					
Total.....						1															1

4. SEMIANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

31 to 35 years.....						1															1	2
36 to 40 years.....	1																				1	2
41 to 45 years.....						1																1
Total.....	1					2															1	4

Summary of Tables 1, 2, 3, 4, 5, and 7 (heavier and lighter than air), Tables 2, 3, 4, and 6 (lighter than air only), and Tables 3 and 4, above (observer only), showing waivers of physical defects.

SUMMARY OF TABLES 1 TO 7 ABOVE SHOWING WAIVERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Civilian applicants.....																				1	1
Enlisted applicants.....	4		2			1														2	9
For commission.....	20	6	13	6		18	1				7						1			2	81
Semiannual examinations.....	24	1	35	8	2	28														18	116
Special examinations.....			1	1																	2
For transfer to Air Service.....			1	1																	2
For detail with Air Service.....	2					2														2	6
Total.....	50	7	52	16	2	49	1				7						1		2	30	217

STATISTICS SHOWING RESULTS OF PHYSICAL EXAMINATIONS FOR FLYING, 1921.

Number of examinations arranged according to the purpose for which the examination was given.

Civilian applicants for appointment as cadets, Air Service.....	145
Enlisted applicants for appointment as cadets, Air Service.....	377
Officers for commission in the Air Service, Regular Army.....	167
For rating on completion of flying training.....	199
Semiannual examinations (given in January and July of each year).....	1,521
Special examinations (given when ordered by the commanding officer or thought advisable by the flight surgeon).....	49
For transfer to the Air Service from other branches of the Army.....	123
For training of nonflying officers detailed with the Air Service and nonflying Air Service officers, including medical, naval, and foreign officers, and Reserve Officers Training Corps students.....	245
For commission in the Air Service Reserve Corps under flying status.....	11
Total physical examinations for flying during 1921.....	2,837

(a) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS OF *CIVILIAN* APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Not given.....											
Under 21 years.....	41	24	58.54	16	39.02	1	2.44				
21-27 years.....	104	60	57.69	44	42.31						
28-30 years.....											
31-35 years.....											
36-40 years.....											
41-45 years.....											
46-50 years.....											
Total.....	145	84	57.93	60	41.38	1	.69				

(b) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS OF *ENLISTED* APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

Not given.....											
Under 21 years.....	103	63	61.16	39	37.87	1	0.97				
21-27 years.....	260	162	62.31	98	37.69						
28-30 years.....	8	2	25.00	5	62.50	1	12.50				
31-35 years.....	3			2	66.67	1	33.33				
36-40 years.....	1			1	100.00						
41-45 years.....											
46-50 years.....	2			2	100.00						
Total.....	377	227	60.21	147	38.99	3	.80				

(c) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS FOR FLYING OF FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

Not given.....	1	1	100.00								
Under 21 years.....	1	1	100.00								
21-27 years.....	138	108	78.26	29	21.02	1	0.72				
28-30 years.....	24	19	79.17	5	20.83						
31-35 years.....	3	2	66.67	1	33.33						
36-40 years.....											
41-45 years.....											
46-50 years.....											
Total.....	167	131	78.44	35	20.96	1	.60				

(d) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS FOR RATING ON COMPLETION OF FLYING TRAINING.

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Age not given.....											
Under 21 years.....	23	21	91.30	1	4.35	1	4.35				
21-27 years.....	127	119	93.70	2	1.57	6	4.73				
28-30 years.....	17	15	88.24			1	5.88	1	5.88		
31-35 years.....	17	17	100.00								
36-40 years.....	8	7	87.50			1	12.50				
41-45 years.....	3	3	100.00								
46-50 years.....	4	2	50.00			2	50.00				
Total.....	199	184	92.46	3	1.51	11	5.53	1	.50		

(e) RESULTS, BY AGES, OF SEMI-ANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

(This table includes Regular Army officers, cadets and Reserve officers. A physical examination is required of fliers twice a year by existing regulations, but in 1921 the January examination was omitted and only the July semiannual examination held. Some of those disqualified in this table were for temporary disabilities. As soon as such disabilities are corrected by proper treatment a reexamination is given, and, if the disqualification is found on such reexamination to have been removed, the pilot is authorized to fly.)

Age not given.....	1			1	100.00						
Under 21 years.....	47	44	93.62	1	2.13	2	4.25				
21-27 years.....	788	719	91.24	32	4.06	37	4.70				
28-30 years.....	332	294	88.55	14	4.22	23	6.93	1	0.30		
31-35 years.....	239	198	82.84	12	5.02	28	11.72			1	0.42
36-40 years.....	76	57	75.00	10	13.16	9	11.84				
41-45 years.....	30	21	70.00	2	6.67	6	20.00	1	3.33		
46-50 years.....	7	2	28.57	1	14.29	3	42.86	1	14.28		
51-55 years.....	1		100.00								
Total.....	1,521	1,336	87.84	73	4.80	108	7.10	3	.20	1	.06

(e) (1) RESULTS, BY AGES, OF SEMIANNUAL PHYSICAL EXAMINATIONS SHOWING NUMBER OF RESERVE OFFICERS.

Age not given.....				1							
Under 21 years.....											
21-27 years.....		129		16		4					
28-30 years.....		36		6							
31-35 years.....		18		2							
36-40 years.....		6		1							
41-45 years.....											
46-50 years.....											
Total.....		189		26		4					

(e) (2) RESULTS, BY AGES, OF SEMIANNUAL PHYSICAL EXAMINATIONS SHOWING NUMBER OF CADETS.

Age not given.....											
Under 21 years.....		35				2					
21-27 years.....		181		5		5					
28-30 years.....		11									
31-35 years.....		4									
36-40 years.....		2									
41-45 years.....											
46-50 years.....											
Total.....		233		5		7					

(f) RESULTS, BY AGES, OF SPECIAL PHYSICAL EXAMINATIONS OF FLIERS.

(Upon advice of flight surgeon.)

Age not given.....											
Under 21 years.....											
21-27 years.....	26	21	80.77	5	19.23						
28-30 years.....	14	12	85.71	2	14.29						
31-35 years.....	6	2	33.33	2	33.33	2	33.33				
36-40 years.....		2	100.00								
41-45 years.....	1					1	100.00				
46-50 years.....											
Total.....	49	37	75.51	9	18.37	3	6.12				

(g) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS OF APPLICANTS (OFFICERS) FOR TRANSFER TO THE AIR SERVICE FROM OTHER BRANCHES OF THE SERVICE.

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Age not given.....											
Under 21 years.....	2	2	100.00								
21-27 years.....	69	58	84.06	11	15.94						
28-30 years.....	29	24	82.76	5	17.24						
31-35 years.....	19	13	68.42	6	31.58						
36-40 years.....	2	1	50.00	1	50.00						
41-45 years.....	1	1	100.00								
46-50 years.....	1			1	100.00						
Total.....	123	99	80.49	24	19.51						

(h) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS FOR FLYING TRAINING OF NONFLYING OFFICERS DETAILLED WITH THE AIR SERVICE AND NONFLYING AIR SERVICE OFFICERS (INCLUDING MEDICAL, NAVAL AND FOREIGN OFFICERS, AND STUDENTS, RESERVE OFFICERS' TRAINING CORPS).

Age.	Total examined.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Age not given.....											
Under 21 years.....	110	65	59.09	45	40.91						
21-27 years.....	93	59	63.44	34	36.56						
28-30 years.....	9	6	66.67	2	22.22	1	11.11				
31-35 years.....	18	11	61.11	6	33.33	1	5.56				
36-40 years.....	9	7	77.78	2	22.22						
41-45 years.....	3	2	66.67			1	33.33				
46-50 years.....	3	1	33.33	1	33.33	1	33.33				
Total.....	245	151	61.64	90	36.73	4	1.63				

(i) RESULTS, BY AGES, OF PHYSICAL EXAMINATIONS FOR COMMISSION IN THE AIR SERVICE RESERVE CORPS, UNDER FLYING STATUS.

Age.	Total examined.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Age not given.....											
Under 21 years.....											
21-27 years.....	7	6	85.71	1	14.29						
28-30 years.....	1	1	100.00								
31-35 years.....	3	3	100.00								
36-40 years.....											
41-45 years.....											
46-50 years.....											
Total.....	11	10	90.91	1	9.09						

SUMMARY.

Results of physical examinations irrespective of classes.

Qualified for flying, or flying training.....	2,259
Disqualified for flying, or flying training.....	442
Waived for both heavier and lighter than air.....	131
Waived for lighter than air only.....	4
Waived for observer only.....	1

Total physical examinations for flying during 1921..... 2,837

Results, by ages, of physical examinations—Summary of Tables (a), (b), (c), (d), (e), (f), (g), (h), and (i), above.

Age.	Total examined.	Qualified.		Disqualified.		Waived for all service.		Waived, lighter than air.		Waived for observer.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Not given.....	2	1	50.00	1	50.00						
Under 21 years.....	327	220	67.28	102	31.19	5	1.53				
21-27 years.....	1,612	1,312	81.39	256	15.88	44	2.73				
28-30 years.....	434	373	85.95	33	7.60	26	5.99	2	0.46		
31-35 years.....	308	246	79.87	29	9.42	32	10.39			1	0.32
36-40 years.....	98	74	75.51	14	14.29	10	10.20				
41-45 years.....	34	27	71.05	2	5.27	8	21.05	1	2.63		
46-50 years.....	17	5	29.41	5	29.41	6	35.30	1	5.88		
51-55 years.....	1	1	100.00								
Total.....	2,837	2,259	79.61	442	15.59	131	4.62	4	.14	1	.04

Causes of disqualification for which no waivers were granted.

(All disqualifying defects found are given, in some cases there being several defects found in the same man, so that the total number of defects found does not correspond with the number disqualified.)

CLASS 1.—CIVILIAN APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Fast pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....	4	3	6	2	1	3	1	1	1						1					10	33
21 to 27 years.....	12	1	18	4	5	4	2	2												28	79
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....	16	4	24	6	6	7	3	3	3						2					38	112

CLASS 2.—ENLISTED APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

Under 21 years.....	10	2	11	7	4	3	4	9	3		1				2					28	84
21 to 27 years.....	25	7	36	11	12	5	9	14									2	1		63	185
28 to 30 years.....		1	1			1	1	1	1											4	10
31 to 35 years.....						1	1													2	3
36 to 40 years.....																				1	1
46 to 50 years.....	1		1																	1	3
Total.....	36	10	49	18	16	10	14	24	4		1				2		2	1		99	286

CLASS 3.—FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

Age not given.....																					
Under 21 years.....																					
21 to 27 years.....	1	2	7	2	3	5		1			3								1	20	45
28 to 30 years.....	2		1												1					2	6
31 to 35 years.....	1		1																	2	4
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....	4	2	9	2	3	5		1			3				1				1	24	55

CLASS 4.—FOR RATING ON COMPLETION OF FLYING TRAINING.

Under 21 years.....																				1	1
21 to 27 years.....			2																	3	5
Total.....			2																	4	6

CLASS 5.—SEMIANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

Age not given.....																				1	1
Under 21 years.....																					2
21 to 27 years.....	10	2	1	1		2	3	2	1											23	54
28 to 30 years.....	3		4	2	1	1			1						1					12	22
31 to 35 years.....	4		2	1		2														10	19
36 to 40 years.....	3	1	4			3														7	18
41 to 45 years.....	1		2	1																1	5
46 to 50 years.....						1															1
Total.....	21	3	21	5	1	9	3	2	2						1					54	122

CLASS 6.—SPECIAL PHYSICAL EXAMINATIONS OF FLIERS.

21 to 27 years.....	2		2	1	1			1												2	9
28 to 30 years.....			1																	1	2
31 to 35 years.....			1			1														2	4
Total.....	2		4	1	1	1		1												5	15

Causes of disqualification for which no waivers were granted—Continued.

CLASS 7.—APPLICANTS FOR TRANSFER TO THE AIR SERVICE FROM OTHER BRANCHES OF THE ARMY.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....	4	2	2	2	1	3	1													13	27
28 to 30 years.....	1		1		2	1					1									6	11
31 to 35 years.....	1		1			4														2	10
36 to 40 years.....		1	1																	1	3
41 to 45 years.....																					
46 to 50 years.....																				1	1
Total.....	6	3	5	2	3	8	1				1									23	52

CLASS 8.—PHYSICAL EXAMINATIONS FOR FLYING TRAINING OF NONFLYING OFFICERS DETAILED WITH AIR SERVICE AND NONFLYING AIR SERVICE OFFICERS, RESERVE OFFICERS' TRAINING CORPS, STUDENTS, ETC.

Under 21 years.....	6		6	13	1	4	1	1			3									24	59
21 to 27 years.....	4		9	7	2	2		1			2										28
28 to 30 years.....	1		1		1																3
31 to 35 years.....	3	2	2		2		2													3	14
36 to 40 years.....	2		2	1																	5
46 to 50 years.....		1			1	1					1										4
Total.....	16	3	20	21	7	7	3	2	1		6									27	113

CLASS 9.—FOR COMMISSION IN THE AIR SERVICE RESERVE CORPS UNDER FLYING STATUS.

Age not given.....																					
Under 21 years.....																					
21 to 27 years.....			1																		1
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....			1																		1

SUMMARY OF TABLES 1 TO 9 ABOVE SHOWING NO WAIVERS.

Civilian applicants.....	16	4	24	6	6	7	3	3	3						2					38	112
Enlisted applicants.....	36	10	49	18	16	10	14	24	4		1				2		2	1		99	286
For commission.....	4	2	9	2	3	5		1			3				1				1	24	55
For rating.....			2																	4	6
Semiannual examinations.....	21	3	21	5	1	9	3	2	2						1					54	122
Special examinations.....	2		4	1	1	1		1												5	15
For transfer.....	6	3	5	2	3	8	1				1									23	52
For detail.....	16	3	20	21	7	7	3	2	1		6									27	113
For commission in Air Service Reserve.....			1																		1
Total.....	101	25	135	55	37	47	24	33	10		11				6		2	1	1	274	762

Causes of disqualification waived for both heavier and lighter than air.

(Noserious defects were waived.)

CLASS 1.—CIVILIAN APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....											1										1
21 to 27 years.....																					
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....											1										1

CLASS 2.—ENLISTED APPLICANTS FOR APPOINTMENT AS CADETS, AIR SERVICE.

Under 21 years.....			1																		1
28 to 30 years.....																				1	1
Total.....			1																	1	2

CLASS 3.—FORMER TEMPORARY OFFICERS FOR COMMISSION IN THE AIR SERVICE, REGULAR ARMY.

Age not given.....																					
Under 21 years.....																					
21 to 27 years.....				1																	1
28 to 30 years.....																					
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....				1																	1

CLASS 4.—FOR RATING ON COMPLETION OF FLYING TRAINING.

Under 21 years.....						1															1
21 to 27 years.....	5	1				1														1	8
28 to 30 years.....	1																			1	1
36 to 40 years.....						1															1
46 to 50 years.....	1			1		2															4
Total.....	7	1		1		5														1	15

CLASS 5.—SEMIANNUAL PHYSICAL EXAMINATIONS.

Age not given.....																					
Under 21 years.....	2			1																	3
21 to 27 years.....	11	1	8	6		7	1											1	8		43
28 to 30 years.....	9	1	8	2		6													1		27
31 to 35 years.....	8		9	6		10	1												3		37
36 to 40 years.....	3			1		3													2		9
41 to 45 years.....	1		1			4															6
46 to 50 years.....	1					3															4
Total.....	35	2	26	16		33	2												1	14	129

CLASS 6.—SPECIAL PHYSICAL EXAMINATIONS OF FLIERS.

31 to 35 years.....	1		2	1																	4
36 to 40 years.....																					
41 to 45 years.....	1																				1
46 to 50 years.....																					
Total.....	2		2	1																	5

CLASS 8.—TRAINING OF OFFICERS DETAILED WITH AIR SERVICE, NONFLYING AIR SERVICE OFFICERS, RESERVE OFFICERS' TRAINING CORPS, STUDENTS, ETC.

Age not given.....																					
Under 21 years.....																					
21 to 27 years.....																					
28 to 30 years.....	1																				1
31 to 35 years.....						1															1
36 to 40 years.....																					
41 to 45 years.....						1															1
46 to 50 years.....	1					1															2
Total.....	2					3															5

No defects were waived for both heavier and lighter than air in classes 7 and 9.

Causes of disqualification waived for lighter than air only.

(No serious defects were waived.)

CLASS 4.—FOR RATING ON COMPLETION OF FLYING TRAINING.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....																					
28 to 30 years.....	1	1																			2
31 to 35 years.....																					
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....	1	1																			2

CLASS 5.

28 to 30 years.....	1	1																			2
41 to 45 years.....	1		1			1															3
46 to 50 years.....	1		1																		2
Total.....	3	1	2			1															7

NOTE.—No defects waived for lighter than air in classes 1, 2, 3, 6, 7, 8, and 9.

Causes of disqualification waived for observer only.

(No serious defects were waived.)

CLASS 5.—SEMIANNUAL PHYSICAL EXAMINATIONS OF FLIERS.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Age not given.....																					
Under 21 years.....																					
21 to 27 years.....																					
28 to 30 years.....																					
31 to 35 years.....						1															1
36 to 40 years.....																					
41 to 45 years.....																					
46 to 50 years.....																					
Total.....						1															1

No defects were waived for observer only in classes 1, 2, 3, 4, 6, 7, 8, and 9.

Summary of classes 1, 2, 3, 4, 5, 6, and 8 (heavier and lighter than air), classes 4 and 5 (lighter than air only), and class 5 (observer only) above, showing waivers of physical defects.

	Vision.	Depth perception.	Muscle balance.	Accommodation.	Refraction.	Hearing.	Nystagmus.	Past pointing.	Falling.	Height.	Weight.	Aortic insufficiency.	Aortic stenosis.	Aortic and mitral lesions.	Mitral insufficiency.	Mitral stenosis.	Neuro-Circu-Asth.	Ankylosis, bony.	Ankylosis, fibrous.	All others.	Total.
Civilian applicants.....											1										1
Enlisted applicants.....			1																		1
Commission in air service.....				1																	1
Rating after training.....	8	2				5															17
Semiannual examinations.....	38	3	28	16		35	2												1	14	137
Special examinations.....	2		2	1																	5
Detailed with air service.....	2					3															5
Total.....	50	5	31	19		43	2				1								1	16	168

NOTE.—Thirty-four physical examinations have been received since the above report was closed.

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